

Listing of claims:

1. (Currently Amended) A tube segment for treating a disease process in the vicinity of a luminal structure, said tube segment including radioactive material for producing radiation for treating a disease process said tube segment having radioactive material substantially uniformly disbursed throughout its structure, said tube segment being adapted to be longitudinally slid over and carried by a balloon catheter having a catheter shaft and balloon for insertion in the luminal structure, and being made of expandable and collapsible material, wherein the tube segment is substantially the same length of the balloon, whereby the entire shape of the tube segment is determined by the shape of the balloon as the balloon inflates to expand the segment and deflates to collapse the segment, and wherein the tube segment covers the balloon substantially entirely during inflation and wherein the outer surface of the tube segment is exposed to come into direct contact with the luminal structure.

2. (Original) The tube segment according to claim 1, wherein the radioactive material is in the form of a coating.

3. (Original) The tube segment according to claim 1, wherein the tube segment comprises a mixture of radioactive material and non-radioactive material.

4. (Original) The tube segment according to claim 1, wherein the tube segment comprises non-radioactive material into which is adsorbed radioactive material.

5. (Cancelled)

6. (Original) The tube segment according to claim 1, wherein the radioactive material is present in a predetermined dosage per surface area of the tube segment when the tube segment is in an unexpanded state, but wherein the dosage changes as the tube segment is inflated.

7. (Original) The tube segment according to claim 1, wherein the tube segment is expandable in a range of sizes.

8. (Currently Amended) An apparatus for treating a disease process in the vicinity of a luminal structure, comprising:

a balloon catheter having a shaft and an inflatable balloon; and

a tube segment adapted to be longitudinally slid over and carried by and cover said balloon, said tube segment including radioactive material said tube segment having radioactive material substantially uniformly disbursed throughout its structure, said tube segment, and being made of expandable and collapsible material, wherein the tube segment is substantially the same length of the balloon, whereby the entire shape of the tube segment is determined by the shape of the balloon as the balloon inflates to expand the segment and deflates to collapse the segment, and wherein the tube segment covers the balloon substantially entirely during inflation and wherein the outersurface of the tube segment is exposed to come into direct contact with the luminal structure.

9. (Original) The apparatus according to claim 8, wherein the tube segment comprises radioactive material in the form of a coating.

10. (Original) The apparatus according to claim 8, wherein the tube segment comprises a mixture of radioactive material and non-radioactive material.

11. (Original) The apparatus according to claim 8, wherein the tube segment comprises non-radioactive material into which is absorbed radioactive material.

12. (Cancelled)

13. (Cancelled)

14. (Cancelled)

15. (Cancelled)

16. (Cancelled)

17. (Cancelled)

18. (Cancelled)

19. (Cancelled)

20. (Cancelled)

21. (Cancelled)

22. (Currently Amended) A method for treating a disease process in the vicinity of a luminal structure comprising:

inserting a balloon catheter into a luminal structure, said balloon catheter having an inflatable balloon and a tube segment, said tube segment having radioactive material substantially uniformly disbursed throughout its structure, wherein the tube segment is substantially the same length of the balloon, the tube segment being slideable over the balloon catheter, and the tube segment being of expandable and collapsible material and which includes radioactive material;

inflating the balloon with fluid to expand the tube segment

and move the tube segment to contact the interior of the luminal structure to thereby administer a radiation dose to the luminal structure, said tube segment substantially entirely covering the balloon during inflation;

deflating the balloon and collapsing the tube segment together; and

removing the balloon catheter including the tube segment together after a desired radiation dose has been achieved.

23. (Original) The method, according to claim 22, wherein the step of inflating comprises inflating the balloon with gaseous media.

24. (Original) The method according to claim 23, wherein the gaseous media is selected from the group comprising CO_2 and Argon.

25. (Previously AmendedPresented) A tube segment for treating a disease process in the vicinity of a luminal structure, said tube segment including radioactive material for producing radiation for treating a disease process, said tube segment having varying concentrations of radioactive material for producing a radiation dose which varies along at least one dimension of the tube segment while having substantially equal wall thickness along its longitudinal length.

26. (Original) The tube segment according to claim 25, wherein the dimension is axial.

27. (Original) The tube segment according to claim 25, wherein the dimension is longitudinal.

28. (Previously AmendedPresented) An apparatus for treating a disease process in the vicinity of a luminal

structure, comprising:

a balloon catheter having a shaft and an inflatable balloon; and

a tube segment adapted to be carried by and cover said balloon, said tube segment including radioactive material having varying concentrations of radioactive material for producing radiation for treating a disease process, said tube segment producing a radiation dose which varies along at least one dimension of the tube segment while having substantially equal wall thickness along its longitudinal length.

29. (Previously AmendedPresented) The apparatus according to claim 28, wherein the dimension is axial.

30. (Cancelled)

31. (Cancelled)

32. (Cancelled)